

WO 98/29847

PCT/GB98/00015

Claims

1.
A sleepiness monitor (10),
for a vehicle driver,
or machine operator,
comprising a plurality of sensors (13, 15, 27, 29),
for registering vehicle or machine condition factors,
and attendant driver or operator
control actions or inputs,
10 a personal data entry interface,
a memory for loading with
a circadian physiological or body rhythm reference model,
a microprocessor or other computation engine,
an operating model or algorithm,
15 for weighting the circadian rhythm model,
according to sensory inputs,
and providing a warning indication (18)
of driver or operator sleepiness.

2.
20 A sleepiness monitor,
imparted with knowledge of circadian and sleep parameters
of an individual vehicle driver or machine operator,
and/or generic or universal human physiological factors,
applicable to a whole class or category of driver/operators,
25 integrated with 'real-time' behavioural sensing,
such as of road condition and driver control action,
including steering and acceleration,
to provide an (audio-) visual indication of sleepiness.

3.
30 A driver sleepiness,
alertness or fitness condition monitor,
comprising
a plurality of sensory inputs,
variously and respectively related to,
35 vehicle motion,
circadian or biorhythmic physiological patterns,
recent driver experiences
and pre-conditioning,
such inputs being individually weighted,
40 according to contributory importance,
and combined in a computational decision algorithm or model,
to provide a warning indication of sleepiness.

WO 98/29847

PCT/GB98/00015

4.
A monitor, as claimed in any of the preceding claims, with provision for input of real-time, vehicle driving actions, such as use of steering and accelerator, and integration with inherent biological factors and current personal data, for example recent sleep pattern, age, sex, recent alcohol consumption (within the legal limit), reliant upon input by a driver being monitored.

5.
10 A sleepiness monitor, as claimed in any of the preceding claims, including a sensor for vehicle steering wheel movement.

6.
15 A monitor, as claimed in Claim 5, including a magnetic flux coupled inductive sensor of rate of change of steering movement, with a static magnet mounted upon a steering column housing and a wheel or shaft mounted sensor.

7.
20 A sleepiness monitor, as claimed in any of the preceding claims, including a sensor for vehicle acceleration and/or speed.

8.
25 A sleepiness monitor, as claimed in any of the preceding claims, including a sensor for vehicle cab temperature.

9.
30 A sleepiness monitor, as claimed in any of the preceding claims, including a sensor for ambient light.

10.
A sleepiness monitor, as claimed in any of the preceding claims, including provision, for example by way of push button switches, for input of responses to predetermined questions on driver condition, such as recent sleep history.

11.
A vehicle or machine, incorporating a sleepiness monitor, as claimed in any of the preceding claims.